

Ball Bearing and a Vacuum Pump that is Equipped with a Bearing of this Type

PATENT CLAIMS

1. Ball bearing (1) having an inner race and an outer race, **wherein** the bearing has surfaces (14, 15) which are concentric to the rotational axis (6) and of which one is a part of the rotating bearing race and the other is a part of the fixed bearing race where during normal operation the surfaces (14, 15) are situated opposite one another with a relatively narrow gap (24) therebetween and that in the event of failure the surfaces (14, 15) function as emergency bearing surfaces.
2. Bearing in accordance with claim 1, **wherein** the concentric surfaces (14, 15) also extend axially.
3. Bearing in accordance with claim 1, **wherein** the concentric surfaces (14, 15) have, when viewing the cross section, the shape of a step.

4. Bearing in accordance with claim 1, **wherein** the concentric surfaces (14, 15⁴⁾) extend obliquely with respect to the axis (6) of the bearing.
5. Bearing in accordance with one of the claims 1 to 4, **wherein** the projections (14, 15) simultaneously have the function of a bearing cover.
6. Bearing in accordance with one of the above claims, **wherein** the gap between the emergency bearing surfaces is less than 0.1 mm, preferably less than 0.05 mm.
7. Bearing in accordance with one of the above claims, **wherein** the material for the surfaces of the emergency bearing surfaces is so selected that the drive of the rotating system cannot overcome the friction produced during an emergency rundown so that it switches to failure.
8. Bearing in accordance with one of the claims 1 to 7, **wherein** the material used for the emergency bearing surfaces (14, 15) is steel, preferably hardened rolling bearing steel.
9. Bearing in accordance with one of the claims 1 to 8, **wherein** at least one of the two emergency bearing surfaces (14, 15) is coated.

⁴⁾ **Translator's note:** The German text states "14, 14" here whereas "14, 15" would be more in line with the drawing figures and the remaining text. Therefore "14, 15" has been assumed for the translation.

10. Drag vacuum pump with a stator (6) and a rotor (27) which is supported by a rolling bearing (35, 36), **wherein** at least one of the rolling bearings exhibits the characteristics of one or several of the aforementioned claims.
11. Drag vacuum pump in accordance with claim 10, **wherein** it is equipped with a purge gas facility.